

# INPLASY

## Biomechanical changes following total hip replacement vs. hip resurfacing replacement during activities of daily living

INPLASY202470125

doi: 10.37766/inplasy2024.7.0125

Received: 30 July 2024

Published: 30 July 2024

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### ADMINISTRATIVE INFORMATION

**Support** - This work was supported by a grant (2022R1G1A101123611) from the National Research Foundation of Korea in 2022.

**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202470125

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 July 2024 and was last updated on 30 July 2024.

### INTRODUCTION

**Review question / Objective** This systematic review aimed to provide a comprehensive understanding of biomechanical changes between THA and RHA during activities of daily living.

**Condition being studied** Hip arthroplasty, whether resurfacing hip arthroplasty (RHA) or total hip arthroplasty (THA), is an effective surgical procedure that allows patients with end-stage hip osteoarthritis to restore hip functions and relieve pain. After hip arthroplasty, it is important to assess the biomechanical changes during daily activities such as gait, stair negotiation, sit-to-stand transfers, and balance tasks.

### METHODS

**Participant or population** The main study population included participants who underwent

THA or HRA without restriction on the arthroplasty design.

**Intervention** Not applicable.

**Comparator** Not applicable.

**Study designs to be included** Case-control studies compared post-THA versus post-RHA patients. The main comparison of interest in this systematic review was the effect of the groups (THA vs. RHA).

**Eligibility criteria** 1. The main study population included participants who underwent THA or HRA without restriction on the arthroplasty design. 2. Primary outcomes involved kinematic, kinetic, or muscle activity variables measured by a 3D motion capture system, electrogoniometers, accelerometers, force plates, and electromyography (EMG).

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3. Experimental protocols included daily activities such as gait, sit-to-stand, stair negotiation, and balancing.
  4. Statistical analyses were performed.
  5. The article was in English and published in a peer-reviewed journal.

**Information sources** The review search was conducted through 4 databases: MEDLINE (PubMed), Scopus (Elsevier), Web of Science (Clarivate Analytics), and Embase (Elsevier).

**Main outcome(s)** The main outcomes were biomechanical variables including the kinematic, kinetic, center of pressure (COP), or muscle activity variables.

**Quality assessment / Risk of bias analysis** We used 15 question-modified Down and Black checklist for the quality assessment. Our modified version included 15 questions that were evaluated from the following sub-groups: reporting (items 1, 2, 3, 5, 6, 7, and 10), external validity (items 11 and 12), internal validity (items 16, 18, and 21), and internal validity confounding (items 21, 22, and 25) (Table 2). These items were selected for their suitability for non-randomized and case control studies.

**Strategy of data synthesis** Not applicable.

**Subgroup analysis** Not applicable.

**Sensitivity analysis** Not applicable.

**Country(ies) involved** South Korea.

**Keywords** total hip arthroplasty; hip resurfacing arthroplasty; THA; RHA; Biomechanics; activities of daily living.

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